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SYNNESTVEDT & LECHNER, LLP
2600 ARAMARK TOWER
1101 MARKET STREET
PHILADELPHIA, PA 191072950

EXAMINER
BUSS, BENJAMIN J

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/697,481	SCHWARTZ ET AL.
Office Action Summary	Examiner	Art Unit
	Benjamin J. Buss	2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 October 2003 and 12 May 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-25</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>10/31/03</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>3/1/2004</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claims 1-25 are pending in this application.

Priority

5   Examiner acknowledges Applicant's claim for priority based on 60/422,787 filed on 10/31/2002.

Specification

The disclosure is objected to because of the following informalities:

-     ¶11: Change "monitored equipment is presently experience the disorder/failure associated" to -- monitored

10   equipment is presently experiencing the disorder/failure associated --.

Appropriate correction is required.

Claim Objections

Claims 6 is objected to because of the following informalities:

15   -   Claim 6 (p34 L3): Change "failure is communication from" to -- failure is communicated from --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

20   *The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.*

25   Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The

claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in

the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is not feasible

to have a new disorder for a respective object that does not have a statistically significant correlation to a known profile

while also having this profile accessible for diagnosis of disorders of similar objects. This indicates that there are

30   multiple similar outliers being diagnosed at the same time and the knowledge from one diagnosis is available to other

simultaneous diagnoses in progress. Examiner recommends changing L9 on page 40 from "disorders of similar

objects at locations" to either -- disorders of similar subsequent objects at locations -- or to -- disorders of similar

objects in the future at locations --.

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Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1, 14, 20-21, and 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to

particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claim 1 recites the limitation "the distributed objects" in L10. There is insufficient antecedent basis for this

   limitation in the claim.

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- Claim 1 recites the limitation "said knowledge base" in L14. There is insufficient antecedent basis for this

   limitation in the claim.

- Claim 14 recites the limitation "predetermined disorder patterns" in L10 of p35. There is insufficient

   antecedent basis for this limitation in the claim.

- Claims 20-21 and 23-25: The term "statistically significant" in claims 20-21 and 23-25 is a relative term which

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   renders the claim indefinite. The term "statistically significant" is not defined by the claim, the specification

   does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not

   be reasonably apprised of the scope of the invention. It is unclear how the statistical significance is to be

   determined. Applicant should define the phrase "statistically significant" in the claims. The person of ordinary

   skill in the art should not have to guess the conditions under which a correlation is "statistically significant".

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Appropriate corrections are required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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Claims 20-25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject

matter. The computer system must set forth a practical application of a §101 judicial exception to produce a real-world

result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to

a substantial practical application. Simply identifying an object as experiencing a known disorder condition does not

have any affect on a real world situation.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to

achieve a particular result are useful, tangible, and concrete. If the claim is directed to a practical application of the

§101 judicial exceptions producing a result tied to the physical world that does not preempt the judicial exception, then

the claim meets the statutory requirement of 35 U.S.C. §101.

The phrases 'comparing data gathered', 'identifying said first object as experiencing the known disorder

condition', are not clear in purpose or scope.

The invention must be for a practical application and either:

1) specify transforming (physical thing – article) or

2) have the Final Result (not the steps) achieve or produce a

useful (specific, substantial, AND credible),

concrete (substantially repeatable/non-unpredictable), AND

tangible (real world/non-abstract) result

(tangibility is the opposite of abstractness).

A claim that is so broad that it reads on both statutory and non-statutory subject matter must be amended, and

if the specification discloses a practical application but the claim is broader than the disclosure such that it does not

require the practical application, then the claim must be amended.

Claims that acquire data, correlate the data to known profiles, and identify the correlation which is most

statistically significant are not statutory. Claims additionally adding newly identified profiles to a database for objects

with no statistically significant correlation to existing profiles are also not statutory.

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

90   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under

this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in
> this country, more than one year prior to the date of application for patent in the United States.

95   Claims 1-4, 6, 12-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Deb$_{July2000}$ ("Remote Diagnosis

Server").

Claim 1:

100   Deb$_{July2000}$ anticipates:

- A plurality of data acquisition computers, each of said plurality of data acquisition computers being operatively

    connected for gathering data from corresponding sensors monitoring a corresponding object (pages 6.B.2-1

    through 8 especially "sensor agents" p1C1, "data stream ... detailed sensor data" p2C1, "sensor data from

    distributed systems" p4C2, and "sensor agent" p5C1);

105   - A diagnostic computer system remotely located from said plurality of data acquisition computers, said

    diagnostic computer system comprising (pages 6.B.2-1 through 8 especially p2C2-p6C1):

    - o A database for storing status data relating to the distributed objects, said status data being gathered

        by said plurality of data acquisition computers (pages 6.B.2-1 through 8 especially "TEAMS-KB" p2C2-

        p6C1);

110   - o An expert system configured for performing signal processing to analyze said status data and

            identifying disorders of the distributed objects as a function of a correlation between said status data

            and data stored in said knowledge base (pages 6.B.2-1 through 8 especially "TEAMS-RT" p2C2-

            p5C1); and

        - o An alarm system for automatically generating an alarm upon identification of a disorder of one of the

115   distributed objects (pages 6.B.2-1 through 8 especially "generate comprehensive, global system health

            reports... failure predictions... before it actually happens" p4C2-p5C1); and

    - A server computer located remotely from the objects, said server computer being operatively connected to

        said diagnostic computer system for communication of data therewith, said server computer storing in its

memory a knowledge base for storage of data relating to various types of distributed objects, and information

120   relating to said diagnostic computer system (page 6.B.2-1 through 8 especially "broker" p2C2-p5C1).

Claim 2:

Deb$_{July2000}$ anticipates:

-    Wherein said expert system stores data acquisition rules identifying data acquisition parameters, said expert

125   system being operatively connected to said plurality of data acquisition computers to automatedly cause data

to be gathered from a monitored object in accordance with corresponding data acquisition parameters

identified by a rule applicable to the monitored object (pages 6.B.2-1 through 8 especially p1C1, p2C1, and

p4C2-p5C1; *This system clearly has data acquisition rules and parameters which control the sensor agents.*

Additionally, this is shown in that "The system is built upon "The essential constructs of the RDS

130   framework...described in [8]" (p3C1) *which states "The Sensor-Agent is responsible for acquisition of sensor*

signals, signal conditioning (if necessary) and ... may retrieve commands to be executed from supervisor

TEAMS-RT ... mode changes and drill-down tests that will allow quicker or more precise diagnosis."

(Deb$_{May2000}$, "Telediagnosis: Remote monitoring of large-scale systems", especially p34C2) and "The sensor

client loads the list of sensors it is supposed to monitor, identify system modes and sensor rates/timing

135   *information etc., and start retrieving sensor data. It may invoke the preprocessing module's signal processing*

routines and test decision rules to convert test data into test results." (Deb$_{May2000}$, "Telediagnosis: Remote

monitoring of large-scale systems", especially p35C1)).

Claim 3:

140   Deb$_{July2000}$ anticipates:

-    Wherein said expert system is configured to vary its signal processing according to signal processing results

reflecting a current health status of a monitored distributed object, said expert system being configured to

automatically vary such signal processing according to predetermined rules stored in the expert system (pages

6.B.2-1 through 8 especially p5C2-p6C2; *It is clear that TEAMS-RT varies its signal processing* "based on the

145   test outcome" (p5C2), *which is the health status of a monitored distributed object, and by* "reporting results

only when the diagnosis changed" (p6C2). *Additionally, this configuration is shown in that "The system is built*

upon "The essential constructs of the RDS framework...described in [8]" (p3C1) which states "the Sensor-Agent may retrieve commands to be executed from supervisor TEAMS-RT ... include mode changes and drill-down tests that will allow quicker or more precise diagnosis." (Deb_{May2000}, "Telediagnosis: Remote monitoring of large-scale systems", especially p34C2)).

Claim 4:

Deb_{July2000} anticipates:

- Wherein the knowledge base stores object-specific rules regulating data acquisition, signal processing, monitoring and system operation (pages 6.B.2-1 through 8 especially "on multiple systems ... diagnose multiple failures" p2C1 and "health assessment ... detailed sensor data ... remote monitoring solution" p2C1 and "diagnostic state of each of the systems" p4C1 and "TEAMS-KB ... model and diagnostic data management ... maintenance related actions" p4C1 and "remote health monitoring ... sensor data form the distributed systems ... updates the health status ... generate comprehensive, global system health reports and analyses of all the different systems" p5C1. *Additionally, this configuration is shown in that "The system is built upon "The essential constructs of the RDS framework...described in [8]" (p3C1) which states "The sensor client loads the list of sensors it is supposed to monitor, identify system modes and sensor rates/timing information etc., and start retrieving sensor data. It may invoke the preprocessing module's signal processing routines and test decision rules to convert test data into test results." (Deb_{May2000}, "Telediagnosis: Remote monitoring of large-scale systems", especially p35C1)).*

Claim 6:

Deb_{July2000} anticipates:

- Wherein said knowledge base of said server includes information relating to a type of object, and wherein said diagnostic computer system stores Information relating to a specific object monitored by a corresponding data acquisition computer, wherein detection of a new pattern of failure is communication from said diagnostic computer system to said server for future use in diagnosis of remotely located objects (pages 6.B.2-1 through 8 especially "diagnostic state of each of the systems" p4C1 and "Diagnostic data management ... predicting parts requirements" and also "ambiguity group" p5C2-p6C1).

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Claim 12:

DebＪｕｌｙ2000 anticipates:

- Wherein each monitored object is conceptually decomposed to a relatively small set of basic components

    (pages 6.B.2-1 through 8 especially "components that comprise the model" p4C1).

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Claim 13:

DebＪｕｌｙ2000 anticipates:

- Wherein the conceptual decomposition relates to a type of distributed objects (pages 6.B.2-1 through 8

    especially "components that comprise the model" p4C1).

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Claim 14:

DebＪｕｌｙ2000 anticipates:

- Wherein the predetermined disorder patterns relate to the basic components (pages 6.B.2-1 though 8

    especially "TEAMS-RT" p2C2-p5C1 and "models and components that comprise the model" p4C1; *The*

190   *"predetermined disorder patterns" are interpreted to be whatever is in the database to correlate to, since those*

    patterns have been necessarily been determined prior to the point in time during which the correlation is

    performed).

Claim 15:

195   **Deb**Ｊｕｌｙ2000 anticipates:

- Wherein the system automatically adds to the knowledge base a new disorder pattern that does not

    correspond to a predetermined disorder pattern (pages 6.B.2-1 through 8 especially "create and modify

    models" p4C1 and "capturing and managing diagnostic test and session history logs, managing schedules and

    tracking and prediction parts requirements" p4C1 and also "ambiguity group" p5C2-p6C1).

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Claim 16:

Deb_{July2000} anticipates:

- Wherein the new disorder pattern is automatically related to all distributed objects of a related type (pages 6.B.2-1 through 8 especially "create and modify models" p4C1 and "capturing and managing diagnostic test and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and also "ambiguity group" p5C2-p6C1).

Claim 17:

Deb_{July2000} anticipates:

- Wherein the knowledge base comprises:
  - A rule domains entity including a data acquisition rule domain (pages 6.B.2-1 through 8 especially "sensor agents" p1C1, "data stream ... detailed sensor data" p2C1, "sensor data from distributed systems" p4C2, and "sensor agent" p5C1);
  - A signal processing rule domain (pages 6.B.2-1 through 8 especially "processed by offsite reasoners" p2C2 and "remote reasoning services ... assessment and diagnosis" p2C2 and "consisting of ... and TEAMS-KB" p2C2 and "different diagnostic agents" p4C2 and "utilize the failure and diagnostic history of different systems" p4C2 and "TEAMS-RT agent to process the data" p5C1),
  - A system customization rule domain (pages 6.B.2-1 through 8 especially "custom database systems" p4C1 and "controlling the functionality of the different diagnostic agents" p4C2),
  - A disorder recognition confidence rule domain (pages 6.B.2-1 through 8 especially "improves confidence in system ... continuously and accurately assessed, with a high degree of certainity" p1C2 and p4C2-p6C1),
  - An archiving rule domain (pages 6.B.2-1 through 8 especially "TEAMS-RT agent retrieves the health report from the server and writes them ... logs the report to TEAMS-KB for further analysis" p5C1 and "health status report ... logged in TEAMS-KB" p5C1-p5C2 and "generate comprehensive, global system health reports" p4C2 and "data captured are used by TEAMS-KB for parts management and prediction" p6C1),

      o A report generation rule domain (pages 6.B.2-1 through 8 especially "health status report ... logged in

TEAMS-KB" p5C1-p5C2 and "generate comprehensive, global system health reports" p4C2 and "RT-

230   agent reporting results only when the diagnosis changed" p6C2-p7C1), and

      o A data transmission rule domain (pages 6.B.2-1 through 8 especially "transmit data" p1C1 and

"transmitting sensor data" p2C2 and "accessible over internet and modems" p7C2).

(It is clear that in order to perform a task, the rules for performing that task must be known by the system.)

Claim Rejections - 35 USC § 103

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Claims 5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Deb**$_{July2000}$ ("Remote Diagnosis

Server") in further view of **Mikhael** (USPN 7,016,885).

Claim 5:

240   **Deb**$_{July2000}$ fails to teach:

- Wherein the system for identifying disorders of the distributed objects calculates probabilities of predefined

patterns of typical disorders as being a currently observed disorder.

Mikhael teaches:

- Wherein the system for identifying disorders of the distributed objects calculates probabilities of predefined

245   patterns of typical disorders as being a currently observed disorder (C1-14 especially "In FIG. 6, the pattern

with the highest probability of occurrence is identified ... a signal with higher probability is classified with fewer

classification stages compared with a signal with lower probability ... for recognition" C9:20-C10:7 and "The

number of stages required ... pattern ... the probability of occurrence of signals differs from one signal to the

other ... order of their probability" C14:55-67).

250   Motivation:

    Deb$_{July2000}$ and **Mikhael** are from the same field of endeavor, signal processing and classification. It would

have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of

Deb$_{July2000}$ by calculating probabilities of predefined patterns being observed as taught by **Mikhael** for the

benefit of having a system "that continuously enhances itself using all the information available up to that

255   point" (**Mikhael** C3:50-65) and is "capable of recognizing an enormously large number of patterns" (**Mikhael**

C5:40-63) using a classifier capable of yielding "100% classification accuracy" (**Mikhael** C7:30-50) "to enhance the system's reliability particularly under nonideal conditions" (**Mikhael** C10:40-50) since this "is expected to lead to an overall reduction in the average time and amount of computations required for recognition" (**Mikhael** C10:1-7).

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Claim 7:

DebJuly2000 fails to teach:

- Wherein the diagnostic computer system relates to a current disorder pattern and a predefined disorder pattern stored in the knowledge base as points in multi-dimensional space.

265 **Mikhael** teaches:

- Wherein the diagnostic computer system relates to a current disorder pattern and a predefined disorder pattern stored in the knowledge base as points in multi-dimensional space (C1-14 especially "multidimensional signals ... transform domain" C4:40-55, "transforms" C5:10-30 and "pattern recognizer extracts the features in parallel, from more than one transform domain" C6:14-31 and "transform" C11:40-56 and "multidimensional

270 signal classification .. projections of the signals ... in multiple transform domains" C14:30-45).

Motivation:

DebJuly2000 and **Mikhael** are from the same field of endeavor, signal processing and classification. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of **Deb**July2000 by relating observed patterns to predefined patterns stored as points in multi-dimensional space as

275 taught by **Mikhael** for the benefit of having a system "that continuously enhances itself using all the information available up to that point" (**Mikhael** C3:50-65) and is "capable of recognizing an enormously large number of patterns" (**Mikhael** C5:40-63) using a classifier capable of yielding "100% classification accuracy" (**Mikhael** C7:30-50) "to enhance the system's reliability particularly under nonideal conditions (**Mikhael** C10:40-50) since this "is expected to lead to an overall reduction in the average time and amount of

280 computations required for recognition" (**Mikhael** C10:1-7).

Claim 8:

DebJuly2000 fails to teach:

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- Wherein the diagnostic computer system provides a current disorder classification as a function of a distance between points representing typical disorders and a point representing the current disorder.

Mikhael teaches:

- Wherein the diagnostic computer system provides a current disorder classification as a function of a distance between points representing typical disorders and a point representing the current disorder (C1-14 especially "distance" C10:25-55).

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Motivation:

Deb_{July2000} and **Mikhael** are from the same field of endeavor, signal processing and classification. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of **Deb**_{July2000} by performing classification as a function of a distance between points as taught by **Mikhael** for the benefit of having a system "that continuously enhances itself using all the information available up to that

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point" (**Mikhael** C3:50-65) and is "capable of recognizing an enormously large number of patterns" (**Mikhael** C5:40-63) using a classifier capable of yielding "100% classification accuracy" (**Mikhael** C7:30-50) "to enhance the system's reliability particularly under nonideal conditions (**Mikhael** C10:40-50) since this "is expected to lead to an overall reduction in the average time and amount of computations required for recognition" (**Mikhael** C10:1-7).

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Claim Rejections - 35 USC § 103

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Deb**_{July2000} ("Remote Diagnosis Server") in view of **Deb**_{May2001} ("Remote Diagnosis Server Architecture").

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Claim 9:

Deb_{July2000} fails to teach:

- wherein the diagnostic computer system creates an online analytical model of probability trends for object disorders.

Deb_{May2001} teaches:

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- wherein the diagnostic computer system creates an online analytical model of probability trends for object disorders (pages 988-997 especially "statistical data analysis ... trend and anomaly detection/isolation" p989).

Motivation:

Deb$_{July2000}$ and Deb$_{May2001}$ are from the same field of endeavor, remote diagnosis. It would have been obvious

to one of ordinary skill in the art at the time of the invention to modify the teachings of Deb$_{July2000}$ by using data

315   mining for trend and anomaly detection/isolation as taught by Deb$_{May2001}$ for the benefit of aiding in reliability

analysis, online monitoring and diagnosis, scheduled and unscheduled maintenance management, and

system testing while utilizing a common model of the system.

Claim 10:

320   Deb$_{July2000}$ teaches:

-    Wherein the diagnostic computer system forecasts a time when corrective actions should be taken to correct a

disorder of the monitored object by future extrapolation of said analytical model (pages 6.B.2-1 through 8

especially "predicting parts requirements" p4C1 and "utilize the failure and diagnostic history of different

systems ... to display failure predictions thus allowing ... before it actually happens" p5C5-p6C1; Also see

325   Figure 1).

Claim Rejections - 35 USC § 103

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deb$_{July2000}$ ("Remote Diagnosis Server") and

Deb$_{May2001}$ ("Remote Diagnosis Server Architecture") in further view of **Menard** (US Patent Application Publication

330   2002/0184065).

Claim 11:

The combination of Deb$_{July2000}$ and Deb$_{May2001}$ fails to teach:

-    Wherein a threshold for the extrapolation is defined by heuristic rules stored in the knowledge base.

335   **Menard** teaches:

-    Wherein a threshold for the extrapolation is defined by heuristic rules stored in the knowledge base (pages 1-

11 especially "data analysis process ... analyzes the values of the collected datapoints to determine if a

threshold has been exceeded ... a Reasoning System ... predictive analysis engine probable cause of a

notification or an estimated time to failure ... corrective action ... automatically ... predictions based on a

340   threshold value ... pattern matches information in a knowledge base with a high degree of certainty" ¶50).

<u>Motivation:</u>

Deb_{July2000}, Deb_{May2001} and **Menard** are from the same field of endeavor, system diagnosis. It would have

been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of

Deb_{July2000} and Deb_{May2001} by defining a threshold for the extrapolation using heuristic rules stored in the

345   knowledge base as taught by **Menard** for the benefit of satisfying the needs for monitoring and infrastructure

management of modern business systems by capturing and representing expert knowledge about

infrastructure components, and monitoring their behavior (**Menard** ¶11) and determining what type of analysis

is needed and diagnosing problems and conditions, making predictions based on a threshold value for

datapoints (**Menard** ¶50).

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Claim Rejections - 35 USC § 103

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deb_{July2000} ("Remote Diagnosis

Server") in view of **Menard** (US Patent Application Publication 2002/0184065).

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Claim 18:

Deb_{July2000} fails to teach:

-   Wherein the knowledge base stores threshold values relating to diagnostic parameters for each basic

    component, and a disorder pattern for each basic component.

360   **Menard** teaches:

-   Wherein the knowledge base stores threshold values relating to diagnostic parameters for each basic

    component, and a disorder pattern for each basic component (pages 1-11 especially "data analysis process ...

    analyzes the values of the collected datapoints to determine if a threshold has been exceeded ... a Reasoning

    System ... predictive analysis engine probable cause of a notification or an estimated time to failure ...

365   corrective action ... automatically ... predictions based on a threshold value ... pattern matches information in

    a knowledge base with a high degree of certainty" ¶50).

Motivation:

Deb_{July2000} and **Menard** are from the same field of endeavor, system diagnosis. It would have been obvious to

one of ordinary skill in the art at the time of the invention to modify the teachings of Deb_{July2000} by storing

370 .   threshold values relating to the diagnosis for each component and a pattern for each component as taught by

Menard for the benefit of satisfying the needs for monitoring and infrastructure management of modern

business systems by capturing and representing expert knowledge about infrastructure components, and

monitoring their behavior (**Menard** ¶11) and determining what type of analysis is needed and diagnosing

problems and conditions, making predictions based on a threshold value for datapoints (**Menard** ¶50).

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Claim 19:

Deb_{July2000} teaches:

-       Wherein information relating to a specific distributed object is obtained automatically during a customization

step before initiation of monitoring and diagnosis of the specific distributed object (pages 6.B.2-1 through 8

380   especially "separation of the system-specific knowledge" p2C1 and "models that fit the configuration of the

specific system that is being diagnosed" p3C1).

Deb_{July2000} fails to teach:

-       Wherein diagnostic indicator disorder thresholds are obtained.

Menard teaches:

385   -   Wherein information relating to a specific distributed object, and diagnostic indicator disorder thresholds, are

obtained automatically during a customization step before initiation of monitoring and diagnosis of the specific

distributed object (pages 1-11 especially "data analysis process ... analyzes the values of the collected

datapoints to determine if a threshold has been exceeded ... a Reasoning System ... predictive analysis

engine probable cause of a notification or an estimated time to failure ... corrective action ... automatically ...

390   predictions based on a threshold value ... pattern matches information in a knowledge base with a high degree

of certainty" ¶50).

Motivation:

Deb_{July2000} and **Menard** are from the same field of endeavor, system diagnosis. It would have been obvious to

one of ordinary skill in the art at the time of the invention to modify the teachings of Deb_{July2000} by storing

395   threshold values relating to the diagnosis for each component and a pattern for each component prior to

initiation of monitoring and diagnosis as taught by **Menard** for the benefit of satisfying the needs for monitoring

and infrastructure management of modern business systems by capturing and representing expert knowledge

about infrastructure components, and monitoring their behavior (**Menard** ¶11) and determining what type of

analysis is needed and diagnosing problems and conditions, making predictions based on a threshold value

400   for datapoints (**Menard** ¶50).

This claim is not functionally distinctive over what is normally done, since basic system information is usually

known, and thresholds are usually set, prior to initiation of a monitoring/diagnosis/analysis of one or more

objects.

405   *Claim Rejections - 35 USC § 102*

Claims 20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by **Deb**_{May2001} ("Remote Diagnosis Server

Architecture").

Claim 20:

410   **Deb**_{May2001} anticipates:

-      Providing a data acquisition system for acquiring data from a first object during its operation, said data

acquisition system acquiring data for certain operating parameters for said first object (pages 988-997

especially "sensor agents" p1 and "sensor data" p991 and p995-996 and "data collection" p989);

-      Providing a database of disorder profiles for various objects including said first object, said database of

415   disorder profiles comprising data for the certain operating parameters that is representative of a known

disorder condition (pages 988-997 especially "TEAMS-KB" 988-989);

-      Comparing data gathered from said system to the data of said disorder profiles to identify any disorder profile

having a respective statistically significant correlation (pages 988-997 especially "statistical data analysis"

p989 and "multisignal model" p988-989 and "Failure Modes" p989); and

420   -   Identifying said first object as experiencing the known disorder condition corresponding to the corresponding

disorder profile having a most statistically significant correlation (pages 988-997 especially "detection" p989 &

p996 and "health assessment" p990 & p996 and "diagnosis" p988-997).

Claim 23:

425   Deb_{May2001} anticipates:

- A plurality of data acquisition computers, each of said plurality of data acquisition computers being operatively

  connected for gathering data from a corresponding sensor monitoring a component of a corresponding object

  (pages 988-997 especially "sensor agents" p1 and "sensor data" p991 and p995-996 and "data collection"

  p989);

430   - A server computer located remotely from the objects, said server computer being operatively connected to

  said plurality of data acquisition computers for communication of data therewith, said server computer storing

  in its memory a database of disorder profiles for various types of basic components of objects, each of said

  disorder profiles comprising data for the certain operating parameters that is representative of a known

  disorder condition (page 988-997 especially "broker" p988-997 and "TEAMS-KB" p988-989);

435   - A diagnostic computer system (pages 988-997 especially "TEAMS-RT" p988-991) remotely located from said

  plurality of data acquisition computers, said diagnostic computer system being configured for:

     o   Comparing gathered data relating to said component to data of said disorder profiles corresponding to

         a similar basic component to identify any disorder profile having a respective statistically significant

         correlation (pages 988-997 especially "statistical data analysis" p989 and "multisignal model" p988-

440   989 and "Failure Modes" p989); and

     o   Identifying said corresponding object as experiencing the known disorder condition corresponding to

         the disorder profile having the most statistically significant correlation (pages 988-997 especially

         "statistical data analysis" p989 and "detection" p989 & p996 and "health assessment" p990 & p996

         and "diagnosis" p988-997).

445

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this

Office action:

450   (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section
       102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that
       the subject matter as a whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

455   Claims 21-22 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Deb**_{May2001} ("Remote

Diagnosis Server Architecture") in view of **Deb**_{July2000} ("Remote Diagnosis Server").

Claim 21:

Deb_{May2001} fails to teach:

460   -   Adding to the database as a new disorder profile the data gathered from said data acquisition system for said

first object if said data does not have a statistically significant correlation to any of said disorder profiles.

Deb_{July2000} teaches:

-    Adding to the database as a new disorder profile the data gathered from said data acquisition system for said

first object if said data does not have a statistically significant correlation to any of said disorder profiles (pages

465   6.B.2-1 through 8 especially "create and modify models" p4C1 and "capturing and managing diagnostic test

and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and also

"ambiguity group" p5C2-p6C1).

Motivation:

Deb_{May2001} and **Deb**_{July2000} are from the same field of endeavor, remote diagnosis. It would have been obvious

470   to one of ordinary skill in the art at the time of the invention to modify the teachings of **Deb**_{May2001} by creating

and modifying models and components that comprise the mode, including capturing and managing diagnostic

test and session history logs, managing schedules and tracking and predicting parts requirements as well as

further testing ambiguous groups which do not have a statistically significant until the failure is isolated and

then logging the session history and capturing the parts replacement data, which can be used for future

475   diagnosis and prognosis, as taught by **Deb**_{July2000} for the benefit of managing models and test libraries,

providing an integrated environment for model development, and allowing easy ties to existing custom

database systems that perform maintenance related actions.

Claim 22:

480   **Deb**_{May2001} teaches:

- Providing a second data acquisition system to acquire data from a second object during its operation, said second data acquisition system acquiring data for certain operating parameters for said second object (pages 988-997 especially "sensor agents" p1 and "sensor data" p991 and p995-996 and "data collection" p989);

Deb_{May2001} fails to teach:

485   -   Whereby said new disorder profile is available for consideration of disorder of said second object.

Deb_{July2000} teaches:

- Providing a second data acquisition system to acquire data from a second object during its operation, said second data acquisition system acquiring data for certain operating parameters for said second object (pages 6.B.2-1 through 8 especially "sensor agents" p1C1, "data stream ... detailed sensor data" p2C1, "sensor data

490   from distributed systems" p4C2, and "sensor agent" p5C1);

- Whereby said new disorder profile is available for consideration of disorder of said second object (pages 6.B.2-1 through 8 especially "create and modify models" p4C1 and "capturing and managing diagnostic test and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and also "ambiguity group" p5C2-p6C1).

495   <u>Motivation</u>:

Deb_{May2001} and Deb_{July2000} are from the same field of endeavor, remote diagnosis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Deb_{May2001} by creating and modifying models and components that comprise the mode, including capturing and managing diagnostic test and session history logs, managing schedules and tracking and predicting parts requirements as well as

500   further testing ambiguous groups which do not have a statistically significant until the failure is isolated and then logging the session history and capturing the parts replacement data, which can be used for future diagnosis and prognosis, as taught by Deb_{July2000} for the benefit of managing models and test libraries, providing an integrated environment for model development, and allowing easy ties to existing custom database systems that perform maintenance related actions.

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Claim 24:

Deb_{May2001} fails to teach:

-     Wherein said diagnostic computer system is configured to add to the database as a new disorder profile for a respective basic component the data gathered from said component if said data does not have a statistically

510   significant correlation to any of said disorder profiles.

Deb$_{July2000}$ teaches:

-     Wherein said diagnostic computer system is configured to add to the database as a new disorder profile for a respective basic component the data gathered from said component if said data does not have a statistically significant correlation to any of said disorder profiles (pages 6.B.2-1 through 8 especially "create and modify

515   models" p4C1 and "capturing and managing diagnostic test and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and also "ambiguity group" p5C2-p6C1).

Motivation:

    Deb$_{May2001}$ and **Deb**$_{July2000}$ are from the same field of endeavor, remote diagnosis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of **Deb**$_{May2001}$ by creating

520   and modifying models and components that comprise the mode, including capturing and managing diagnostic test and session history logs, managing schedules and tracking and predicting parts requirements as well as further testing ambiguous groups which do not have a statistically significant until the failure is isolated and then logging the session history and capturing the parts replacement data, which can be used for future diagnosis and prognosis, as taught by **Deb**$_{July2000}$ for the benefit of managing models and test libraries,

525   providing an integrated environment for model development, and allowing easy ties to existing custom database systems that perform maintenance related actions.

Claim 25:

Deb$_{May2001}$ teaches:

530   -   A plurality of data acquisition computers, each of said plurality of data acquisition computers being operatively connected for gathering data from a corresponding sensor monitoring a corresponding monitored object (pages 988-997 especially "sensor agents" p1 and "sensor data" p991 and p995-996 and "data collection" p989);

-     A plurality of diagnostic computers (pages 988-997 especially "TEAMS-RT" p988-991), each of said plurality of

535   diagnostic computers being configured to:

       o Compare data gathered from said corresponding monitored object to data of a pre-existing disorder profile for a similar object to identify a respective statistically significant correlation (pages 988-997 especially "statistical data analysis" p989 and "multisignal model" p988-989 and "Failure Modes" p989);

540   o Identify said corresponding monitored object as experiencing the known disorder condition if there is a statistically significant correlation (pages 988-997 especially "statistical data analysis" p989 and "detection" p989 & p996 and "health assessment" p990 & p996 and "diagnosis" p988-997); and

       o Identify a new disorder condition of the corresponding monitored object that does not have a statistically significant correlation to the known disorder condition (pages988-997 especially "evolve

545   with the system" p988); and

    - A server computer located remotely from the objects, said server computer being operatively connected to said plurality of diagnostic computers for communication of data therewith, said server computer storing in its memory a database of disorder profiles for various objects, each of said disorder profiles comprising data for the certain operating parameters that is representative of a known disorder condition (page 988-997 especially

550   "broker" p988-997 and "TEAMS-KB" p988-989);

Deb_{May2001} fails to teach:

    - Wherein each of said diagnostic computers is configured to add to the server's database as a new disorder profile for a respective object the data gathered from said corresponding monitored object that represents said new disorder condition if said data does not have a statistically significant correlation to any disorder profile of

555   any known disorder condition;

    - Whereby said new disorder profile is retained at said remotely located server and is accessible for diagnosis of disorders of similar objects at locations distinct from said corresponding monitored object.

Deb_{July2000} teaches:

    - Wherein each of said diagnostic computers is configured to add to the server's database as a new disorder

560   profile for a respective object the data gathered from said corresponding monitored object that represents said new disorder condition if said data does not have a statistically significant correlation to any disorder profile of any known disorder condition (pages 6.B.2-1 through 8 especially "create and modify models" p4C1 and

"capturing and managing diagnostic test and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and also "ambiguity group" p5C2-p6C1);

565 - Whereby said new disorder profile is retained at said remotely located server and is accessible for diagnosis of disorders of similar objects at locations distinct from said corresponding monitored object (pages 6.B.2-1 through 8 especially "create and modify models" p4C1 and "capturing and managing diagnostic test and session history logs, managing schedules and tracking and prediction parts requirements" p4C1 and "utilize the failure and diagnostic history of different systems" p4C2 and also "ambiguity group" p5C2-p6C1).

570 Motivation:

$Deb_{May2001}$ and $Deb_{July2000}$ are from the same field of endeavor, remote diagnosis. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of $Deb_{May2001}$ by creating and modifying models and components that comprise the mode, including capturing and managing diagnostic test and session history logs, managing schedules and tracking and predicting parts requirements as well as

575 further testing ambiguous groups which do not have a statistically significant until the failure is isolated and then logging the session history and capturing the parts replacement data, which can be used for future diagnosis and prognosis, as taught by $Deb_{July2000}$ for the benefit of managing models and test libraries, providing an integrated environment for model development, and allowing easy ties to existing custom database systems that perform maintenance related actions.

580

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Van Oort (USPN 6,695,790)

- Litt (USPN 6,658,287)

585 - Discenzo (USPN 6,326,758)

- House (US Patent Application Publication 2004/0044499)

- Lundstedt (US Patent Application Publication 2003/0154044)

- Kehr (US Patent Application Publication 2003/0036683)

- Blemel (US Patent Application Publication 2002/0038199)

590 - Burge (US Patent Application Publication 2002/0103662)

- Bocionek (USPN 6,551,243)

- Takagi (USPN 6,385,502)

- Chio (US Patent Application Publication 2002/0120201)

- Benediktsson ("Neural Network Approaches Versus Statistical Methods in Classification of Multisource

595   Remote Sensing Data")

Claims 1-12, 15-18, and 20-25 are rejected.

Correspondence Information

600   Any inquiry concerning this communication or earlier communications from the examiner should be directed to

Benjamin J. Buss whose telephone number is 571-272-5831. The examiner can normally be reached on M-F 9AM-
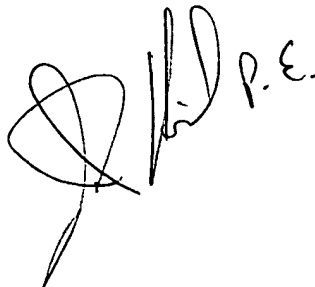
5PM.

         If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent

can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is

605   assigned is 571-273-8300.

         Information regarding the status of an application may be obtained from the Patent Application Information

Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or

Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the

610   Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

                                         Benjamin J Buss
                                         Examiner
                                         Art Unit 2129

BJB